

Claims

1. A materials handling device, comprising:
 - (a) a chassis;
 - (b) an elongated handle shaft mounted to said chassis for use in maneuvering said device;
 - 5 (c) at least one roller rotationally mounted to said chassis and in contact with a surface;
 - (d) at least one battery pack supported on said handle shaft and being configured so as to substantially surround a portion of said handle shaft;
 - 10 (e) a drive unit spaced from said battery pack and mounted to said chassis so as to drivingly engage said roller; and
 - (f) means for electrically connecting said battery pack to said drive unit to supply electrical power to
 - 15 operate said drive unit to transmit a high torque driving output to said roller so that a rotary driving output can then be supplied by said roller to enable said device to thereby move across the surface and to manipulate and move a heavy load.
2. The device of claim 1 wherein said battery pack includes a plurality of individual battery cells.
3. The device of claim 2 wherein said battery cells are NiCad batteries.
4. The device of claim 2 wherein said battery cells are NiMH batteries.
5. The device of claim 2 wherein said battery cells are Lithium batteries.
6. The device of claim 2 wherein each of said battery cells has about a 1.2 volt rating.

7. The device of claim 6 wherein said battery pack includes forty of said battery cells such that said battery pack has about a 48 volt rating.

8. The device of claim 2 wherein said battery pack includes a housing of annular configuration supporting said battery cells in stacked end-to-end electrically contacting relationships and upper and lower electrical contacts
5 electrically contacting end ones of said stacked battery cells.

9. The device of claim 8 wherein said housing has a central passage formed therethrough for receiving said handle shaft such that said housing supports a plurality of stacks of said battery cells spaced apart from one another
5 about said handle shaft.

10. The device of claim 8 wherein said housing is includes a pair of holders being semi-cylindrical in configuration that fit and fasten together to provide said housing with said annular configuration and said passage
5 therethrough.

11. A materials handling device, comprising:

(a) a chassis;

(b) at least one rechargeable battery pack removably and replaceably supported on said device;

5 (c) an electric motor and gearbox in a driving relation with a roller in contact with a surface; and

(d) a controller supported on said chassis and having a plurality of capacitors connected to said battery pack and charged by said battery pack so as to have available a
10 store of electrical power, said capacitors of said controller being electrically connected between said battery pack and said electric motor such that said capacitors of said controller can supply said store of electrical power to said electric motor instantaneously

15 when needed which via said gearbox can transmit a high torque driving output to said roller so that a rotary driving output can then be supplied by said roller to enable said device to thereby move across the surface and to manipulate and move a heavy load.

12. The device of claim 11 further comprising:
a switch connected to said controller and being activatable by an operator to cause said capacitors of said controller to discharge and supply instantaneously said
5 store of electrical power to said electric motor.

13. The device of claim 11 wherein said electric motor is about a 48-volt electric motor.

14. The device of claim 11 further comprising:
an elongated handle shaft mounted to said chassis for use in maneuvering said device.

15. The device of claim 14 wherein said battery pack is supported on said handle shaft.

16. The device of claim 14 wherein said battery pack includes a plurality of individual battery cells.

17. The device of claim 16 wherein said battery cells are NiCad batteries.

18. The device of claim 16 wherein said battery cells are NiMH batteries.

19. The device of claim 16 wherein said battery cells are Lithium batteries.

20. The device of claim 16 wherein each of said battery cells has about a 1.2 volt rating.

21. The device of claim 20 wherein said battery pack includes forty of said battery cells such that said battery pack has about a 48 volt rating.

22. The device of claim 16 wherein said battery pack includes a housing of annular configuration supporting said battery cells in stacked end-to-end electrically contacting relationships and having upper and lower electrical
5 contacts electrically contacting end ones of said stacked battery cells.

23. The device of claim 22 wherein said housing has a central passage formed therethrough for receiving a portion of said device such that said housing supports a plurality of stacks of said battery cells spaced apart from
5 one another about said portion of said device.

24. The device of claim 22 wherein said housing is includes a pair of holders semi-cylindrical in configuration that fit and fasten together to provide said housing with said annular configuration and said passage
5 therethrough.

25. A materials handling device, comprising:
 (a) a chassis;
 (b) an elongated handle shaft pivotally mounted to said chassis for use in maneuvering said device;
5 (c) at least one roller rotationally mounted to said chassis;
 (d) a battery pack supported on said handle shaft;
 (e) an electric motor and gearbox fitted within said roller in-line with a rotational axis of said roller; and
10 (f) a controller supported on said chassis and having a plurality of capacitors connected to said battery pack and charged by said battery pack so as to have available a store of electrical power, said capacitors of said controller being electrically connected between said

15 battery pack and said electric motor such that said
capacitors of said controller can supply said store of
electrical power to said electric motor instantaneously
when needed which via said gearbox can transmit a high
torque driving output to said roller so that a rotary
20 driving output can then be supplied by said roller to
enable said device to thereby move across a surface and to
manipulate and move a heavy load.

26. The device of claim 25 wherein said handle shaft
has a switch mounted thereon and connected to said
controller and being activatable by an operator to cause
said capacitors of said controller to discharge and supply
5 instantaneously said store of electrical power to said
electric motor.

27. A materials handling system, comprising:

(a) a battery charger disposed at a location nearby
an area of operation and operable to convert a rechargeable
battery pack from a discharged condition to a charged
5 condition; and

(b) a materials handling device displaced from said
battery charger and being operable for moving a load at the
area of operation, said materials handling device including
(i) a drive unit provided on the device;
10 (ii) a plurality of rechargeable battery packs,
at least one of said rechargeable battery packs being
removably and replaceably provided on said device for
supplying electrical power to operate said drive unit, at
least another of said rechargeable battery packs being
15 provided at the location of said battery charger and
maintained in a charged condition by said battery charger
so that said another rechargeable battery pack is available
to replace said at least one rechargeable battery pack on
said device upon said at least one rechargeable battery
20 pack on said device reaching the discharged condition, and
(iii) a controller provided on said device and

having a plurality of capacitors connected to said at least one rechargeable battery pack on said device, said capacitors being charged by said at least one rechargeable battery pack on said device so as to have available a store of electrical power, said capacitors also being electrically connected between said at least one rechargeable battery pack and said drive unit such that said capacitors can supply said store of electrical power to said drive unit instantaneously when needed such that said drive unit can transmit a high torque driving output to enable said device to thereby move across a surface and to manipulate and move the load.

28. The system of claim 27 further comprising:
a switch provided on said device and connected to said controller and being activatable by an operator to cause said capacitors of said controller to discharge and supply instantaneously said store of electrical power to said drive unit.

29. The system of claim 27 wherein each of said battery packs includes a plurality of individual battery cells.

30. The system of claim 29 wherein said battery cells are NiCad batteries.

31. The system of claim 29 wherein said battery cells are NiMH batteries.

32. The system of claim 29 wherein said battery cells are Lithium batteries.

33. The system of claim 29 wherein each of said battery cells has about a 1.2 volt rating.

34. The system of claim 29 wherein each of said

battery packs includes forty of said battery cells such that said battery pack has about a 48 volt rating.

35. The system of claim 27 wherein said drive unit includes an electric motor having about a 48-volt rating.

36. A materials handling system, comprising:

(a) a battery charger disposed at a location nearby an area of operation and operable to convert a rechargeable battery pack from a discharged condition to a charged condition; and

(b) a materials handling device displaced from said battery charger and being operable for moving a load at the area of operation, said materials handling device including

(i) a chassis,

(ii) at least one roller rotationally mounted to said chassis and in contact with a surface at the area of operation,

(iii) a drive unit mounted to said chassis so as to drivingly engage said roller,

(iv) a plurality of rechargeable battery packs, at least one of said rechargeable battery packs being removably and replaceably supported on said device for supplying electrical power to operate said drive unit, at least another of said rechargeable battery packs being disposed at the location of said battery charger and maintained in a charged condition by said battery charger so that said another rechargeable battery pack is available to replace said at least one rechargeable battery pack on said device upon said at least one rechargeable battery pack on said device reaching the discharged condition, and

(v) a controller supported on said chassis and having a plurality of capacitors connected to said at least one rechargeable battery pack on said device, said capacitors being charged by said at least one rechargeable battery pack on said device so as to have available a store of electrical power, said capacitors also being

electrically connected between said at least one rechargeable battery pack and said drive unit such that said capacitors can supply said store of electrical power
35 to said drive unit instantaneously when needed such that said drive unit can transmit a high torque driving output to said roller so that a rotary driving output can then be supplied by said roller to enable said device to thereby move across a surface and to manipulate and move the load.